United States Department of the Interior
Bureau of Land Management
Royal Gorge Field Office
3028 E. Main Street
Cañon City, CO 81212

Environmental Assessment

McCarthy Federal 1-12 HZ **APD**

DOI-BLM-CO-200-2012-0082 EA

August, 2012

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CHAPTER 1 - INTRODUCTION

1.1 IDENTIFYING INFORMATION

CASEFILE/PROJECT NUMBER (optional):

PROJECT TITLE: McCarthy Federal 1-12-HZ
PLANNING UNIT:

LEGAL DESCRIPTION: Weld County, T4N., R66W., Sec. 12 SWNW

APLLICANT: Kerr-McGee O&G Onshore LP.

1.2 INTRODUCTION AND BACKGROUND

BACKGROUND: This EA has been prepared by the BLM to analyze environmental impacts of well pad, access road, and connecting pipeline construction on private surface/private minerals that will access federal and private minerals, located in the central part of Weld County 5 miles south of the City of Greeley, Colorado. The federal mineral estate within the project boundary is leased and subject to oil and gas development.

1.3 PURPOSE AND NEED

The purpose of the action is to provide the applicant the opportunity to develop their leases for the production of oil and gas. The need for the action is to develop oil and gas resources on Federal Lease COC28428 consistent with existing Federal lease rights provided for in the Mineral Leasing Act of 1920, as amended.

1.4 DECISION TO BE MADE

The BLM will decide whether to approve the proposed McCarthy Federal 1-12HZ APD project based on the analysis contained in this Environmental Assessment (EA). This EA will analyze the proposed action; to construct a well pad, access road, and a connecting pipeline, in order to drill and develop federal minerals from private surface/private minerals. Access to the proposed well pad would be on existing county and rural roads. The finding associated with this EA may not constitute the final approval for the proposed action.

1.5 PLAN CONFORMANCE REVIEW

PLAN CONFORMANCE REVIEW: The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

Name of Plan: Northeast Resource Area Plan and Record of Decision as amended by the Colorado Oil and Gas Final EIS and Record of Decision (RD)

Date Approved: 09/16/86 amended 12/06/91

Decision Number: O&G Resources, Issue 21

Decision Language:

In January 1997, the Colorado State Office of the BLM approved the Standards for Public Land Health and amended all RMPs in the State. Standards describe the conditions needed to sustain public land health and apply to all uses of public lands.

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes.

Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods.

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential.

Standard 4: Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Standard 5: The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado.

Because standards exist for each of these five categories, a finding must be made for each of them in an environmental analysis. These findings are located in Chapter 3 of this document.

1.6 SCOPING, PUBLIC INVOLVEMENT AND ISSUES

1.5.1 Scoping: NEPA regulations (40 CFR §1500-1508) require that the BLM use a scoping process to identify potential significant issues in preparation for impact analysis. The principal goals of scoping are to allow public participation to identify issues, concerns, and potential impacts that require detailed analysis.

Persons/Public/Agencies Consulted: Scoping, by posting this project on the Royal Gorge Field Office NEPA website, was the primary mechanism used by the BLM to initially identify issues. No comments were received.

Issues Identified:
No issues were identified during public scoping.

CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The BLM has received Application for Permit to Drill (APD), proposing the construction of a well pad location and access road on private surface/private minerals in the central part of Weld County, 5 miles south of the City of Greeley. The federal mineral estate in the vicinity of the proposed surface location is leased and subject to oil and gas development.

The general area description would be defined as rural farmland and ranchland south of the South Platte River Basin. There are few county roads in the project area and a state highway nearby. Most access is limited to private landowner or oil and gas developed roadways. The roadways vary in development but most are dirt/primitive roads.

Extensive oil and gas development has occurred in the nearby Wattenberg field, mostly on private mineral estate.

Finally, because the proposed action location is within an ozone nonattainment area, a general conformity analysis for ozone will be completed for the proposed activity. Potential emissions of VOCs and NOx will be calculated in order to determine their conformity with the applicable laws and statutes.

2.2 ALTERNATIVES ANALYZED IN DETAIL

2.2.1 Proposed Action

The proposed action is to construct a well pad and access road in order to drill and develop federal minerals from a private surface over private minerals. Access to the proposed McCarthy Federal 1-12HZ well pad would be gained by traveling on existing county and rural roads.

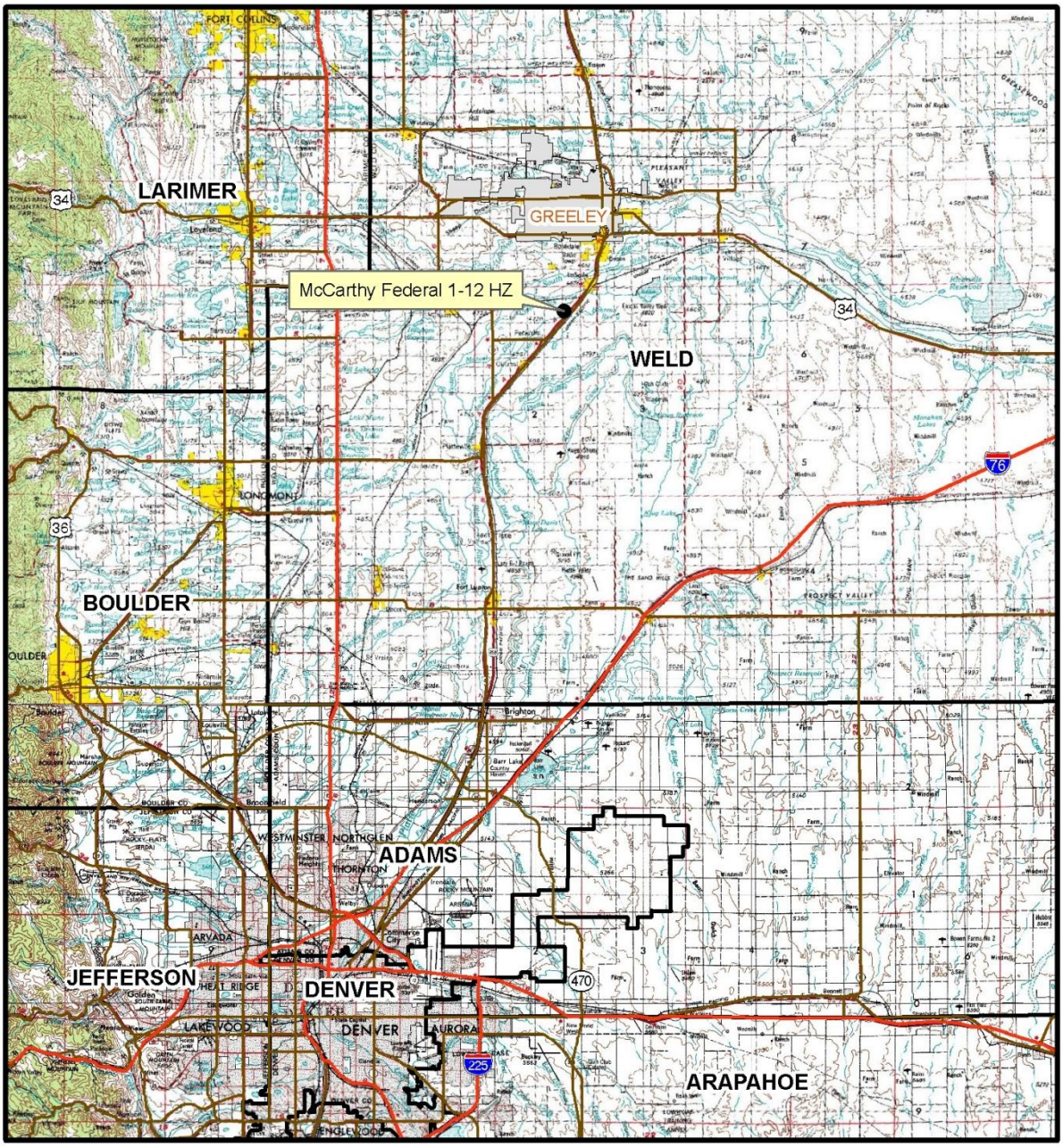
The proposed projects are located in the central part of Weld County, 5 miles south of the City of Greeley, Colorado. The mineral estate within the project boundary is leased and subject to oil and gas development.

Proposed pad would have a maximum cut of 4 feet and a maximum fill of 2 feet. Construction of the well pad would result in approximately 10 acres of new surface disturbance, which would be reduced after successful interim reclamation. Left over top and sub soil piles not used in the interim reclamation will be protected in order to prevent erosion.

Total area that would be disturbed during the construction is 10 acres. The proposed drilling and completion will utilize a closed loop system, no reserve or storage pit is being proposed.

In the event of a dry hole the pads and access roads will be graded to original contour, topsoil replaced and the entire area reseeded. Rehabilitation of the well pads and access roads are bonded to ensure compliance with BLM reclamation requirements. The proposed action would include well drilling and completion operations, which would take approximately 50 days for the well, and interim and final reclamation measures. The Application for Permit to Drill (APD) for each new well includes a drilling program and a multi-point surface use and operations plan that describe details of well pad construction and interim and final reclamation. The proposed action would be implemented consistent with the terms of Federal Lease COC 28428 and with Conditions of Approval (COAs) attached to the APD.

Regional Map



N
W E
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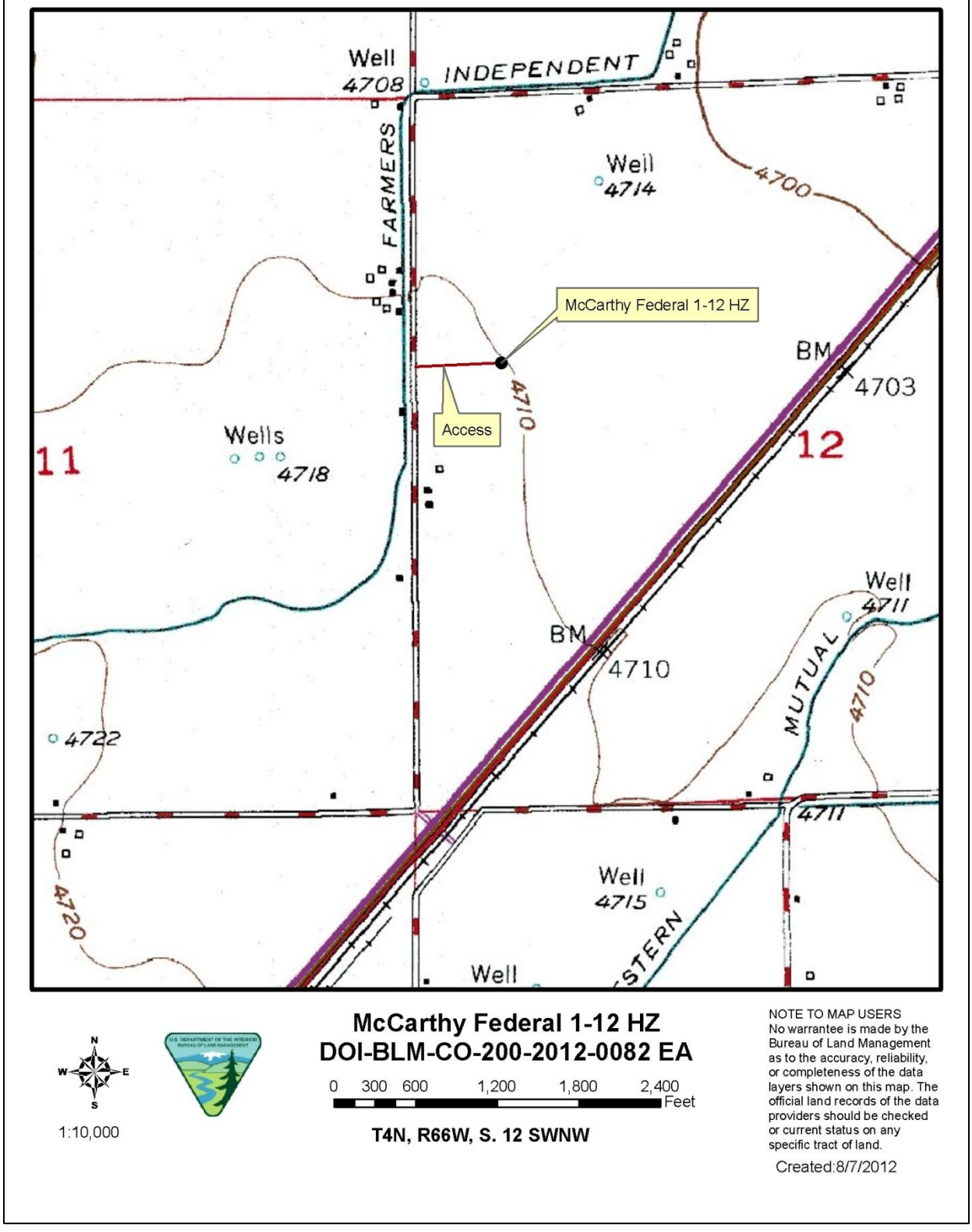
0 2 4 8 12 16 Miles

T4N, R66W, S. 12 SWNW

NOTE TO MAP USERS
No warrantee is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of the data layers shown on this map. The official land records of the data providers should be checked or current status on any specific tract of land.

Created:8/7/2012

Sites-specific Topographic Map ,



Sites-specific Aerial Map,

1:6,907

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0 205 410 820 1,230 1,640 Feet

T4N, R66W, S. 12 SWNW

NOTE TO MAP USERS
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Created:8/7/2012

2.2.2 No Action Alternative

The proposed action involves Federal subsurface minerals that are encumbered with Federal oil and gas leases, which grant the lessee a right to explore and develop the leases. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The no action alternative constitutes denial of the APD associated with the proposed action. Under the no action alternative, therefore, none of the proposed developments described in the proposed action would take place.

2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Other alternatives were not considered due to the proposed project being a non-discretionary action being proposed on private surface.

CHAPTER 3 - AFFECTED ENVIRONMENT AND EFFECTS

3.1 INTRODUCTION

This section provides a description of the human and natural environmental resources that could be affected by the Proposed Action and presents comparative analyses of the direct, indirect and cumulative effects on the affected environment stemming from the implementation of the actions under the Proposed Action and other alternatives analyzed.

3.1.1 Interdisciplinary Team Review

The following table is provided as a mechanism for resource staff review, to identify those resource values with issues or potential impacts from the proposed action and/or alternatives. Those resources identified in the table as impacted or potentially impacted will be brought forward for analysis.

Resource	Initial and date	Comment or Reason for Dismissal from Analysis
Air Quality *Ty Webb, Chad Meister, Melissa Hovey*		See affected environment
Geology/Minerals *Stephanie Carter, Melissa Smeins*	MJS, 1/23/13	See affected environment
Soils *John Smeins*	TK, 7/8/12	All infrastructure (roads, drill pads, etc.) being proposed, would be built and reclaimed according to BLM Gold Book standards unless otherwise stipulated by the surface owner.
Water Quality Surface and Ground *John Smeins*	JS, 8/15/12	See affected environment
Invasive Plants *John Lamman*	JL, 8/13/12	See affected environment.

Resource	Initial and date	Comment or Reason for Dismissal from Analysis
T&E and Sensitive Species *Matt Rustand*	MR, 8/13/12	No T&E concerns in a cultivated agricultural field.
Vegetation *Jeff Williams, Chris Cloninger, John Lamman*	JL, 8/13/12	Project location is surrounded by active farm land. No established native vegetation exists.
Wetlands and Riparian *Dave Gilbert*	DG, 8/13/12	Proposed action is within a cultivated agriculture field.
Wildlife Aquatic *Dave Gilbert*	DG, 8/13/12	Proposed action is within uplands.
Wildlife Terrestrial *Matt Rustand*	MR, 8/13/12	Terrestrial wildlife is likely present on the site; however, the current land is highly disturbed due to the presence of a cultivated field. The construction, presence, and operation of a well will have no additional impact.
Migratory Birds *Matt Rustand*	MR, 8/13/12	See affected environment.
Cultural Resources *Monica Weimer, Erin Watkins*	MMW, 11/9/12	A single historic site (5WL7293), which is not eligible for the NRHP, was recorded during the cultural resources inventories [see Report CR-RG-13-79 (P)]. Therefore, no historic properties will be affected by the proposed undertaking.
Native American Religious Concerns *Monica Weimer, Erin Watkins*	MMW, 11/9/12	No possible traditional cultural properties were located during the cultural resources inventory. There is no other known evidence that suggests the project area holds special significance for Native Americans.
Economics *Dave Epstein, Martin Weimer*	mw, 8/16/12	The setting for the oil and gas well is rural in nature, being located in a farmer's field. Economics would primarily affect only the property owner and the oil and gas operator. The action will not result in significant impacts to the socio economics of the region.
Paleontology *Melissa Smeins, Stephanie Carter*	MJS, 1/23/13	See affected environment
Visual Resources *Kalem Lenard*	KL, 8/14/12	The project is within a highly modified environment with existing structures and wells and would not impact visual resources.
Environmental Justice *Martin Weimer*	mw, 8/16/12	The proposed action affects areas that are rural in nature. The land adjacent to the well site is farmland, as a result, there are no minority or low-income populations in or near the project area. As such, the proposal will not have a disproportionately high or adverse environmental effect on minority or low-income populations.
Wastes Hazardous or Solid *Stephanie Carter*	MJS, 1/23/13	See affected environment
Recreation *Kalem Lenard*	KL, 8/14/12	Not Present
Farmlands Prime and Unique *Jeff Williams, Chris Cloninger, John Lamman*	JL, 8/13/12	Not Present

Resource	Initial and date	Comment or Reason for Dismissal from Analysis
Lands and Realty *Steve Craddock, Vera Matthews*		N/A
Wilderness, WSAs, ACECs, Wild & Scenic Rivers *Kalem Lenard*	KL, 8/14/12	Not Present
Wilderness Characteristics *Kalem Lenard*	KL, 8/14/12	Not Present
Range Management *Jeff Williams, Chris Cloninger, John Lamman*	JL, 8/13/12	Not Present
Forest Management *Ken Reed*	KR, 8/8/12	No impacts to forest management and no federally owned timber is involved in the project.
Cadastral Survey *Jeff Covington*	JC, 9/7/12	COS is attached in the project folder.
Noise *Martin Weimer*	mw, 8/16/12	The project area is located in cultivated farmland. Certain levels of noise are associated with drilling operations, these include drill rig operation, compressors/generators and general machine and vehicle operation. These impacts are temporary and terminate when drilling operations are complete.
Fire *Bob Hurley*		N/A
Law Enforcement *Steve Cunningham*		N/A

The affected resources brought forward for analysis include:

- Air quality
- Geology/Minerals
- Water Quality
- Soils
- Invasive Plants
- Vegetation
- Wildlife Terrestrial
- Migratory Birds
- Paleontology
- Wastes Hazardous or Solid

3.2 PHYSICAL RESOURCES

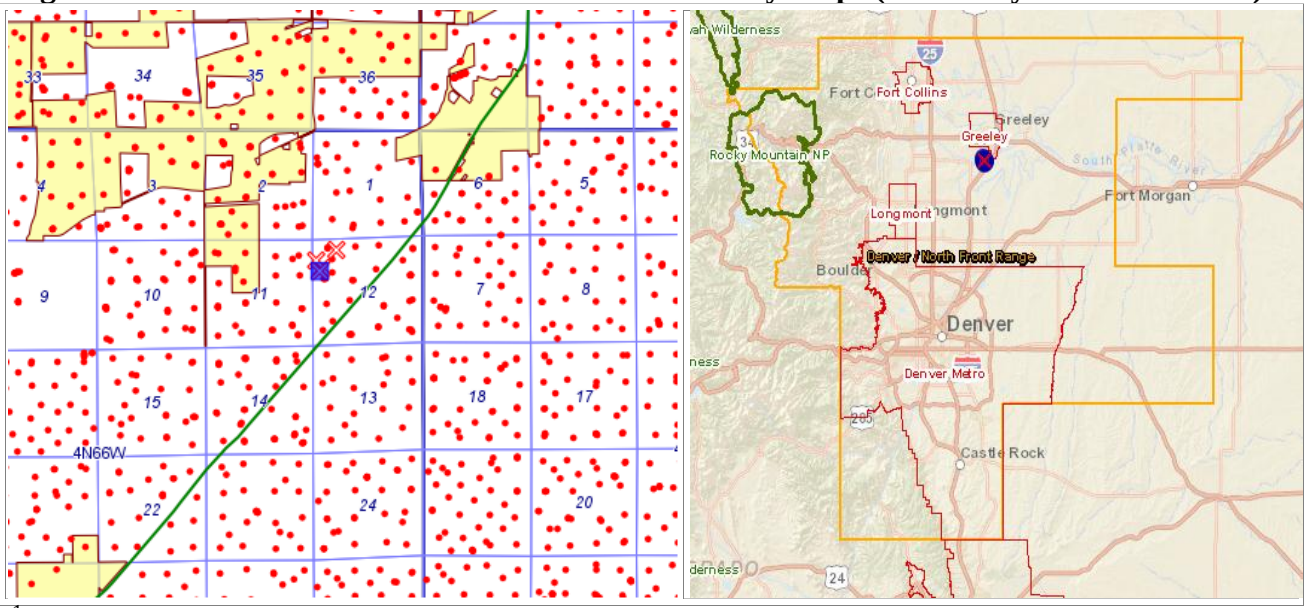
3.2.1 AIR QUALITY AND CLIMATE

Affected Environment: The proposed action area (Northern Weld County) is predominantly used for agriculture. Approximately 75% of the available land area of Weld County is linked to the agricultural sector of the economy in one form or another. Oil and gas development is another major economic driver for the area, and Weld County has some 17,000 active wells within its boundaries

Air quality within the region is marginal, and has experienced problems with attaining the National Ambient Air Quality Standards in the past for Ozone and Carbon Monoxide. The population density of Weld County within the proposed action area is generally dispersed, with less than 25 people per square mile. Mean temperatures in the area range from 15.6 degrees in January to 88.7 degrees in July. The area receives average annual precipitation of approximately 14.22 inches. Frequent winds in the area provide excellent dispersion characteristics for anthropogenic emissions.

Activities occurring within the area that affect air quality include exhaust emission from cars, drilling rigs, agricultural equipment, and other vehicles, and oil and gas development activities, as well as fugitive dust from roads, agriculture, and energy development.

Figure 3-1. COGCC and APCD GIS Location Boundary Maps (McCarthy Federal 1-12HZ)



[1] Air Quality Designations are outlined as follows: Yellow – 8 hr. O_3 Non-attainment Area, Red – CO Maintenance Area.

[2] Class 1 areas are outlined in green.

Regulatory Framework: The Clean Air Act (CAA), which was last amended in 1990, requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for criteria pollutants. Criteria pollutants are air contaminants that are commonly emitted from the majority of emissions sources and include carbon monoxide (CO), lead (Pb), sulfur dioxide (SO_2), particulate matter smaller than 10 & 2.5 microns (PM_{10} & $PM_{2.5}$), ozone (O_3), and nitrogen dioxide (NO_2).

The CAA established 2 types of NAAQS:

Primary standards: – Primary standards set limits in order to protect public health, including the health of "sensitive" populations (such as asthmatics, children, and the elderly).

Secondary standards: – Secondary standards set limits in order to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

The EPA regularly reviews the NAAQS (every five years) to ensure that the latest science on health effects, risk assessment, and observable data such as incidence rates are evaluated in order to re-propose any NAAQS to a lower limit if the data supports the finding.
The Colorado Air Pollution Control Commission, by means of an approved State Implementation Plan (SIP) and/or delegation by EPA, can established state ambient air quality standards for any criteria pollutant that is at least as stringent as, or more so, than the federal standards. Ambient air quality standards must not be exceeded in areas where the general public has access. Table 3.1 lists the federal and state ambient air quality standards.

Table 3-2. Ambient Air Quality Standards (EPA 2011)

Pollutant	Primary/	Averaging Time	Level	Form

[final rule cite]		Secondary			
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution [71 FR 61144, Oct 17, 2006]	$PM_{2.5}$	primary and secondary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
			24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary	Annual	0.03 ppm	Arithmetic Average
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

The nearest APCD air monitors to the project sites are the Weld County West Annex (CO), County Tower (O_3), and Hospital (PM_{10} & $PM_{2.5}$) sites located in Greely, and the Platteville Middle School site ($PM_{2.5}$).

Table 3-1. Ambient Air Quality Monitoring Data Trends (CDPHE 2007 – 2010, EPA Forms)

Monitor	Pollutant (Standard)	2007	2008	2009	2010
West Annex	CO (1 Hour - ppm)	4.0	5.0	4.3	2.3
	CO (8 Hour - ppm)	2.5	2.3	2.3	1.8
County Tower	O_3 (8 Hour - ppm)	0.078	0.076	0.075	0.074
Hospital	PM_{10} (24 Hour - µg/m^3)	89	68	63.0	44.0
	$PM_{2.5}$ (24 Hour - µg/m^3)	24.0	25.2	24.7	22.0
	$PM_{2.5}$ (Annual - µg/m^3)	9.5	7.67	8.36	7.6
Platteville	$PM_{2.5}$ (24 Hour - µg/m^3)	24.0	25.2	25.7	21.1
	$PM_{2.5}$ (Annual - µg/m^3)	10.3	8.23	8.24	7.8

The CAA and the Federal Land Policy and Management Act of 1976 (FLPMA) require BLM and other federal agencies to ensure actions taken by the agency comply with federal, state, tribal, and local air

quality standards and regulations. FLPMA further directs the Secretary of the Interior to take any action necessary to prevent unnecessary or undue degradation of the lands [Section 302 (b)], and to manage the public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values" [Section 102 (a)(8)].

The BLM, as the federal entity with jurisdiction for the subject activity, is bound by the requirements of the General Conformity rule under section 176(c) of the Clean Air Act for authorizing activities within a designated nonattainment or maintenance air quality area/region. The subject activity will be located within the Denver-metropolitan and North Front Range Ozone Nonattainment Area (Marginal), and thus a positive General Conformity demonstration or non-applicability analysis is required before the BLM can authorize the applicant's permit to drill. This process ensures that a Federal action conforms to a State, Tribal, or Federal Implementation Plan. The proposed well is not located within the North Front Range CO or PM_{10} maintenance areas, and therefore conformity analysis requirements for those pollutants do not apply. Emissions estimates for direct and indirect Oxides of Nitrogen (NO_X) and Reactive Volatile Organic Compounds (VOC), precursors for the formation of ground level ozone, was prepared for reasonably foreseeable oil and gas development activities for the well site, and includes emissions from construction, production, and maintenance operations. 40 CFR 93.153 defines the *de minimis* thresholds for NO_X and VOC in a marginal or moderate ozone nonattainment area, and outside of any designated transport region, as 100 tons per year (tpy). The subject activity is scheduled to commence in the summer of 2013, with the construction phase lasting approximately 3 months. The life of the well, if economically viable, would be expected to sustain operations for approximately 20 – 30 years once production begins. Maximum foreseeable direct and indirect emissions would occur at the beginning of the project in 2013 (see results below).

The lease area is designated as a Class II Area, as defined by the Federal Prevention of Significant Deterioration (PSD) provision of the CAA. The PSD Class II designation allows for moderate growth or degradation of air quality within certain limits above baseline air quality. The closest Class I area to the proposed well site locations is Rocky Mountain National Park, which lies approximately 68 miles to the west.

Environmental Effects:

Proposed Action (Direct and Indirect Impacts): The proposed action will have a temporary negative impact to air quality which will mostly occur during the construction phase. Utilization of the access road, surface disturbance, and construction activities such as drilling, hydraulic fracturing, well completion, and equipment installation will all impact air quality through the generation of dust related to travel, transport, and general construction. This phase will also produce short term emissions of criteria, hazardous, and greenhouse gas pollutants from vehicle and construction equipment exhausts. Once construction is complete the daily activities at the site will be reduced to operational and maintenance checks which may be as frequent as daily visits. Emissions will result from vehicle exhausts from the maintenance and process technician visits, as well as oil and produced water collection or load out trips. The pads can be expected to produce fugitive emissions of well gas and liquid flashing gases, which can contains a mixture of methane, volatile organic compounds, and inert or non-regulated gases. Fugitive emissions may result from pressure relief valves and working and breathing losses from any tanks located at the site, as well as any flanges, seals, valves, or other infrastructure connections used at the site. Liquid product load-out operations will also generate fugitive emissions of VOCs.

Ozone is not directly emitted like other criteria pollutants. Ozone is chemically formed in the atmosphere via interactions of oxides of nitrogen (NO_X) and volatile organic compounds (VOCs) in the presence of sunlight and under certain meteorological conditions (NO_X and VOCs are ozone precursors). Ozone formation and prediction is complex, generally results from a combination of significant quantities of VOCs and NO_X emissions from various sources within a region, and has the potential to be transported across long ranges. Therefore, it is typically not appropriate to assess (i.e. model) potential ozone impacts of a minor project on potential regional ozone formation and transport. However, the State of Colorado assesses potential ozone impacts from its authorizing activities on a regional basis when an adequate amount of data is available and where such analysis has been deemed appropriate. For this reason (inappropriate scale of analysis), ozone will not be further addressed in this document beyond the related precursor discussions, general conformity analysis, and an appropriate qualitative analysis/comparison to background emissions inventories for the county and SIP (see cumulative impacts).

Emission estimates from the proposed well site were calculated for this EA, and are disclosed in Table 3.2 below. The emissions inventory (EI) considered reasonably foreseeable oil and gas development activities for the proposed wells within the Denver-metropolitan Northern Front Range Nonattainment Area, and includes emissions from both construction and production operations. The following pollutants were inventoried where an appropriate basis, methodology, and sufficient data exists: CO, NO_X (includes NO_2), $PM_{2.5}$, PM_{10}, SO_2, VOCs, HAPs, CO_2, CH_4, and N_2O. The EI was developed using reasonable but conservative scenarios for each activity. Production emissions were calculated based on full production activity for the entire year (2013), and since this will not be the case in reality, the production emissions are considered conservative. Potential emissions were calculated for each well assuming the minimum/basic legally required control measures, site specific voluntary operator controls, operational parameters, and equipment configurations data that was provided by the applicant.

The following assumptions were applied consistently to all potential activities:

- Given the lack of reasonably foreseeable activity on existing roads (lack of location, timing, activity volume, and types of vehicles), it was assumed current vehicular emissions would continue indefinitely, and at minimum would conform to growth outlined in the Draft (07/28/11) Denver-North Front Range (Northern Subarea) 8-Hour Ozone Conformity Determination. Although some or all of the traffic associated with this action would be included within the above reference conformity determination, no credit was taken to exclude vehicular traffic emissions from this analysis.
- The EI used a disturbed surface area of 10 acres for the well pad, no access road construction was considered for the well pad.
- All disturbed surfaces (pads and access roads) would receive appropriate application of water (during construction) or dust palliatives (during operations), but were calculated to achieve a 0 % dust control factor to be conservative.
- All diesel fuel would be standard #2 grade (500 ppm sulfur).
- The well pad equipment would include tanks, separation equipment, and well head compression, but no dehydration or desulfurization units.
- 'Natural gas' would be piped directly into a 3rd party gathering system. The company proposes the use of 100% 'Green Completions'. Blowdown flaring assumed to be limited to no more than 0.015 MMcf per year.

- Drill rigs emissions were based on EPA Non-road Tier 2 emissions standards.
- Fugitive well emissions are based on an applicant provided well component counts.
- No minor New Source Review credit was taken for the General Conformity analysis (i.e. all emissions estimates are included) for project stationary sources likely to receive permitting from APCD.

Table 3-2. Estimated Maximum Annual Emissions (2013) from McCarthy Federal 1-12HZ

	Annual Emissions (tons)												
Activity	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs**	**H_2S**	**CO_2**	**CH_4**	**N_2O**	**CO_{2eq}**	**CO_{2eq} metric tonnes**
Well Pad Construction - Fugitive Dust	1.25	0.12	---	---	---	---	---	---	---	---	---	---	---
Heavy Equipment Exhaust Emissions	0.51	0.49	13.52	0.43	3.16	0.70	0.07	---	1,388.15	0.08	0.04	1,400.69	1,271.04
Commuting Vehicles - Construction	0.47	0.12	1.24	0.01	0.36	0.06	0.01	---	165.47	0.00	0.00	165.56	150.24
Wind Erosion	15.59	2.34	---	---	---	---	---	---	---	---	---	---	---
Completion Venting (100% Green)	---	---	---	---	---	0.49	0.09	0.00	0.05	0.51	0.00	10.70	9.71
Sub-total: Construction	**17.82**	**3.07**	**14.77**	**0.43**	**3.52**	**1.26**	**0.17**	**0.00**	**1,553.67**	**0.59**	**0.04**	**1,576.95**	**1,430.99**
Well Workover Operations - Fugitive Dust	0.00	0.00	---	---	---	---	---	---	---	---	---	---	---
Well Workover Operations - Exhaust	0.00	0.00	0.04	0.00	0.02	0.00	0.00	---	9.29	0.00	0.00	9.37	8.50
Wellpad Visits for Inspection & Repair	0.05	0.00	0.01	0.00	0.06	0.00	0.00	---	4.19	0.00	0.00	4.22	3.83
Wellhead and Compressor Equipment Leaks	---	---	---	---	---	8.59	1.39	0.00	0.74	7.53	0.00	158.79	144.09
Wellhead Compressor Engines Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Oil Wellhead Pumps (Artificial Lift)	0.02	0.02	6.41	0.00	3.20	0.06	0.01	---	255.98	0.00	0.00	256.85	233.08
Condensate Storage	---	---	---	---	---	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Condensate Related Traffic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Oil Tanks	---	---	---	---	---	0.25	0.02	---	0.07	0.00	0.00	0.07	0.07
Oil Related Traffic	0.08	0.02	0.24	0.00	0.06	0.01	0.00	---	31.92	0.00	0.00	31.93	28.98
Water Tanks	---	---	---	---	---	0.07	0.01	---	0.00	0.01	0.00	0.17	0.15
Water Related Traffic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.42	0.00	0.00	0.42	0.38
Water Disposal Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Well Pad Heaters	0.06	0.04	0.73	0.00	0.61	0.04	0.00	---	876.00	0.02	0.02	881.33	799.76
Recompletion Traffic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Re-Completion Venting	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blowdown Venting	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gas Flaring	---	---	0.00	---	0.03	0.01	---	---	7.54	0.06	---	8.84	8.03
Gas Plant Emissions	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	6,862.65	0.13	0.01	6,869.38	6,233.56
Field Dehydrators	---	---	0.00	---	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Sub-total: Operations	**0.21**	**0.09**	**7.44**	**0.01**	**3.98**	**9.04**	**1.42**	**0.00**	**1,186.14**	**7.62**	**0.02**	**1,352.00**	**1,226.86**
Resource Road Maintenance	0.02	0.00	0.00	0.00	0.00	0.00	0.00	---	0.61	0.00	0.00	0.61	0.56
Sub-total: Maintenance	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.61**	**0.00**	**0.00**	**0.61**	**0.56**
Resource Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Wellpad Reclamation	0.02	0.00	0.01	0.00	0.01	0.00	0.00	---	1.30	0.00	0.00	1.31	1.19
Sub-total: Reclamation	**0.02**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**1.30**	**0.00**	**0.00**	**1.31**	**1.19**
Total Emissions (tons)	**18.02**	**3.16**	**22.21**	**0.44**	**7.50**	**10.29**	**1.59**	**0.00**	**2,739.82**	**8.20**	**0.05**	**2,928.95**	**2,657.85**

epa.gov/Exe/ZyPURL.cgi?Dockey=20008SFC.)

Table 3-4 below demonstrates a relative comparison of the project emissions to Weld County's total emissions from 2008. It also shows Weld County's oil and gas area and point source emissions for the same period.

Table 3-4. Proposed Action & Weld County Emissions Comparisons[1]

Pollutant	Emissions, Tons per year			
	McCarthy Federal 1-12HZ	Weld County Total Emissions (2008)	Weld County Oil & Gas Area Source Emissions	Weld County, Oil & Gas Point Source Emissions
NO_X	22.21	29,295	7,763	5,910
CO	7.5	74,544	4,968	5,138
VOC	10.29	82,714	30,810	21,580
PM_{10}	18.02	40,718	375	129
$PM_{2.5}$	3.16	ND	ND	ND
SO_X	0.44	474	ND	4
HAPs	1.59	242	ND	66

[1] CDPHE 2008 APEN Database/Emissions Inventory (most current available). ND = No Data. CDPHE HAP inventory is for benzene only.

The APD project, as designed and submitted, have been evaluated in accordance with the requirements of 40 CFR 93.153 subpart B and have been found to conform for the following reason(s):

McCarthy Federal 1-12HZ:

[X] Potential maximum total Direct and Indirect emissions are below *de minimis* threshold levels:
Ozone (NO_X): 22.21 tpy in 2013 (Maximum Year)
Ozone (VOC): 10.29 tpy in 2013 (Maximum Year)

The project emissions are relatively small compared to the aggregate County emissions, less than 0.3%. APCD published modeling guidance (Colorado Modeling Guideline for Air Quality Permits - January 2002, April 2010) that established thresholds for requiring additional analysis when emissions are exceeded on an annual or short term basis. The modeling thresholds were developed to identify new sources and modifications that would have relatively small impacts on ambient air quality and would not warrant further analysis with respect to applicable standards with a few exceptions. The thresholds (de minimis emissions) establish levels of emissions which have a low probability of causing or contributing to an exceedance of an air quality standard. Each of the APDs calculated emissions are below the APCD established thresholds. Although not specifically a stationary source (i.e. most of the sources are mobile, and would have minimal emissions occurring at the individual sites), the context allows for a reasonable analysis of the estimated worst case emissions that suggests the projects would have insignificant impacts to regional air quality.

Greenhouse Gas Emissions and Climate Change: According to the U.S. Global Change Research Program (2009), global warming is unequivocal, and the global warming that has occurred over the past 50 years is primarily human-caused. Standardized protocols designed to measure factors that may contribute to climate change, and to quantify climatic impacts, are presently unavailable. Moreover,

specific levels of significance have not yet been established by regulatory agencies. Predicting the degree of impact any single emitter of GHGs may have on global climate, or on the changes to biotic and abiotic systems that accompany climate change is highly complex, has considerable uncertainty, and requires intense computer modeling (i.e., super computers). As such, no readily available tools exist to predict impacts a project's emissions would have on the global, regional, or local climate. This analysis is therefore limited to comparing the context of total project GHG emissions, and to emissions recently analyzed by EPA. The analysis also discloses readily available information regarding expected changes to the global climatic system and any empirical evidence of climate change that has occurred to date (see cumulative impacts).

The implementation of the Proposed Action Alternative is estimated to contribute 2,929 tons of carbon dioxide equivalent (CO_2(e)) in the maximum year (2013). Annual operating GHG emissions will be 46% of the total emissions shown for the maximum year. Over the 25 year project timeframe the total GHG emissions expected are approximately 35,377 tons. The total provided does not account for the ultimate use or consumption of any produced minerals at this time due to the fact that the ultimate form of use and any additional processing required to render the product to sufficient quality (which would cause changes to the quantity of product) cannot be predicted with any reasonable certainty. Additionally, it should be noted that production values could vary significantly over the life of the project, making any prediction of the quantities of GHG emitted highly speculative.

In 2007, the state of Colorado's GHG emissions were 124,000,000 metric tons. The proposed action's GHG emissions represent about 0.0026 % of the state of Colorado's GHG emissions. The relative magnitude of greenhouse gas emissions associated with the development of the well is extremely small.

To provide additional context, the EPA has recently modeled global climate change impacts from a model source emitting 20% more GHGs than a 1500MW coal-fired steam electric generating plant (approx. 14,132,586 metric tons per year of CO2, 273.6 metric tons per year of nitrous oxide, and 136.8 metric tons per year of methane). It estimated a hypothetical maximum mean global temperature value increase resulting from such a project. The results ranged from 0.00022 and 0.00035 degrees Celsius occurring approximately 50 years after the facility begins operation. The modeled changes are extremely small, and any downsizing of these results from the global scale would produce greater uncertainly in the predictions. The EPA concluded that even assuming such an increase in temperature could be downscaled to a particular location, it "would be too small to physically measure or detect", see Letter from Robert J. Meyers, Principal Deputy Assistant Administrator, Office of Air and Radiation re: "Endangered Species Act and GHG Emitting Activities (Oct. 3, 2008). The project emissions are a fraction of the EPAs modeled source and are shorter in duration, and therefore reasonable to conclude that the project would have no measurable impact on the climate.

Table 3-5. Greenhouse Gas Emission Comparisons

Inventory Description	CO_2e Emissions (10^6 mtpy)	Proposed Action Percentage
Colorado (2007)	124	0.0026

Total US Greenhouse Gases[1]	6,957	0.0000046

[1]*Inventory of US Greenhouse Gas Emissions and Sinks: 1990–2008* (EPA 2010a) EPA Emissions

Cumulative Impacts: The area currently has a high degree of alteration in the form of agricultural fields, roads, houses, and oil and gas production. The addition of the infrastructure needed to construct and drill the additional pad and well would have a cumulative impact to the area's air quality; however, given the existing level of development in the area, the proposed well's impact would be very minor. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled on Federal, State, and private lands. This could result in a larger impact to air quality in the future. However, given that the area is currently designated as a nonattainment area for ozone, the state requires additional, more stringent pollution control measures for oil and gas activities in such areas.

With respect to ozone, the current nonattainment area episodic anthropogenic emissions budget approved by the Colorado Air Quality Control Commission (December 12, 2008) for NOx and VOCs (ozone precursors) is 334.6 tpd and 425.4 tpd respectively. These emissions represent reductions projected to be realized (in 2010) from the implementation of additional rules which are now a part of the Colorado Air Quality Control Regulations (AQCRs). The reductions were modeled to show progress towards attaining the ozone standard for the worst ozone days. The emissions inventory included a comprehensive speciation of point, mobile (on-road and non-road), oil and gas (point and area), and biogenic sources. The Technical Support Document (TSD) for the inventory provides the basis for the inventory and includes broad cross sections of the economy. As such, and given the projected pace of development for the inventory, it is likely that the project emissions for the McCarthy APD are adequately covered and evaluated in the APCD episodic analysis. Given the likely coverage, it is not anticipated the project will have a measurable impact on regional ozone formation outside of the modeled parameters.

With respect to GHG emissions, the following predictions were identified by the EPA for the Mountain West and Great Plains region (http://www.epa.gov/Region8/climatechange/pdf/ClimateChange101FINAL.pdf):

- The region will experience warmer temperatures with less snowfall.
- Temperatures are expected to increase more in winter than in summer, more at night than in the day, and more in the mountains than at lower elevations.
- Earlier snowmelt means that peak stream flow will be earlier, weeks before the peak needs of ranchers, farmers, recreationalist, and others. In late summer, rivers, lakes, and reservoirs will be drier.
- More frequent, more severe, and possibly longer-lasting droughts will occur.
- Crop and livestock production patters could shift northward; less soil moisture due to increased evaporation may increase irrigation needs.
- Drier conditions will reduce the range and health of ponderosa and lodge pole pine forests, and increase the susceptibility to fire.
- Grasslands and rangelands could expand into previously forested areas.
- Ecosystems will be stressed and wildlife such as the mountain line, black bear, long-nose sucker, marten, and bald eagle could be further stressed.

If these predictions are realized as mounting evidence suggests is already occurring, there could be impacts to resources within the region. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Warmer temperatures with decreased snowfall could have an impact on a particular plants ability to sustain itself within its current range. An increased length of growing season in higher elevations could lead to a corresponding variation in vegetation and change in species composition. These types of changes would be most significant for special status plants that typically occupy a very specific ecological niche. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened or endangered plants may be accelerated. Invasive plant species would be more likely to out-compete native species.

Increases in winter temperatures in the mountains could have impacts on traditional big game migration patterns. Due to loss of habitat, or due to competition from other species whose ranges may shift northward, the population of some animal species may be reduced. Warmer winters with less snow would impact the Canada lynx by removing a competitive advantage they have over other mountain predators. Earlier snowmelt could also have impacts on cold water fish species that occupy streams throughout the planning area. Climate change could affect seasonal frequency of flooding and alteration of floodplains, which could impact riparian conditions. More frequent and severe droughts would have impacts on many wildlife species throughout the region as well as vegetative composition and availability of livestock forage in some areas. Climate change could increase the growing season within the region, however, so longer growing season in theory would result in more forage production provided there is sufficient precipitation. Drier conditions could have severe impacts on forests and woodlands. This could leave these forests and woodlands more susceptible to insect damage and at higher risk of catastrophic wildfires. Increased fire activity and intensity would increase greenhouse gas emissions.

Protective/Mitigation Measures: Kerr-McGee O&G Onshore LP would use industry best practices, including watering, graveling, and reseeding to reduce fugitive dust emissions from vehicular traffic and disturbed surfaces. Interim reclamation and existing agricultural practices will be implemented in order to stabilize the site and prevent fugitive dust from being generated. In addition the BLM requirements will apply:

- Process equipment will be permitted by CDPHE in accordance with applicable requirements and required emissions standards to limit the facility's potential to emit and provide appropriate operating, monitoring, and recordkeeping requirements.
- All Drill Rig engines will be required to meet at minimum EPA Non-Road Tier II Emissions Standards.
- The company will perform 'Green Completions' for the well.
- It's recommended that FRAC Pump engines be required to meet EPA Non-Road Tier III Emissions Standards.

It is expected that the operator will comply with these requirements and make every effort to minimize emissions through good engineering and operating practices to the maximum extent practical.

No Action Alternative (Direct and Indirect Impacts): None of the proposed action elements would be authorized and therefore none of the potential emissions would occur. No impacts to air quality would

occur. The incremental increase to global GHG burden would not happen, however it is entirely likely the predicted climatic changes will occur regardless.

Protective/Mitigation Measures: NA

3.2.2 GEOLOGIC AND MINERAL RESOURCES

Affected Environment: The proposed APD well is located within the Wattenberg gas field in the Denver Basin where the primary target is the Codell/ Niobrara oil and gas. Most oil and gas in the Denver Basin has been produced from Cretaceous sandstones: J-Sandstone, Codell Sandstone, Niobrara Formation, Hygiene Sandstone, and Terry Sandstone (also known informally as the Sussex and Shannon Sandstones). The Laramie-Fox Hills Aquifer is the lowermost part of the Denver Basin bedrock aquifer system. Water from the Laramie Fox-Hills aquifer is used for domestic and agricultural purposes and is generally produced from artesian wells. This aquifer can be up to 350 feet thick, although total thickness of water yielding material rarely exceeds 200 feet. The Lower Fox Hills and upper Pierre Aquifer or upper transition zone of the Pierre shale are also important water resources that should be protected, this interval occurs at depths of about 600' to 1500'. Underlying the Fox Hills is nearly 5,000 feet of Pierre Shale.

Uranium and coal resources are also found in Weld County. Uranium resources are found in the Upper Laramie Formation north of Greely. Coal resources are found throughout the Denver Basin in the Denver Formation and the upper Laramie Formation in the Denver Basin although most of the coal resources in the Denver Basin have come from Laramie Coals.

Several sand and gravel pits have been developed within 5 miles of the proposed wells so sufficient materials should already be available for construction needs.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: The proposed action would drill through the High Plains Aquifer and Laramie-Fox Hills aquifer to produce hydrocarbons from underlying formations. The Laramie formation also contains important coal and uranium deposits. During drilling operations on the parcels, loss of circulation or problems cementing the surface casing may affect freshwater aquifer and mineral zones encountered.

Cumulative Impacts: Cumulative impacts on geology and minerals resources would primarily occur as a result of oil and gas development, which would irreversibly deplete recoverable oil and gas from the producing formations.

Mitigation/Residual Effects: Recommended Mitigation is as follows:

BLM Onshore Order #2 (OO#2) requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones,

lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. A review at the Application for Permit to Drill stage includes a geologic evaluation of the potential subsurface formations that will be penetrated by the wellbore, followed by an engineering analysis of the drilling program to ensure the well construction design is adequate to protect the surface and subsurface environment, including the potential risks identified by the geologist, and all known or anticipated zones with potential risks.

BLM will require that the surface casing be run across the aquifers, and placed at least 100 feet into a formation that should not fracture or breakdown with the maximum weighting of mud that may be needed when drilling to the depth that the intermediate casing is going to be set. Before drilling an intermediate hole, the surface casing will be cemented in place to surface between the casing and the formation.

A BLM representative may be on location during the casing and cementing of groundwater-protective surface casing and other critical casing and cementing intervals constructed to isolate subsurface zones that present high risk for potential adverse impact to human health or safety or at high risk potential for environmental contamination.

A cement bond log will be required on the production casing, to ensure the quality of the cement bond between the casing and the formation. A minimum of 100 feet of cement will be required above any producing interval, or any zone of interest. Remedial cementing procedures will be required when cementing doesn't meet BLM requirements.

If the proposed project plans to utilize federal minerals in the construction of roads, pad building or for any other construction needs, then compliance with 43 CFR 3600 is required. The project proponent will need to submit an application for a mineral materials disposal with BLM, prior to any disturbance being initiated. Federal mineral materials regulations also apply to split estate (i.e. a private surface landowner could not dispose of federal mineral materials for this project, surface or subsurface, without prior authorization from the BLM).

No Action Alternative: Under the no action alternative APDs would be denied and no action would occur. Although, Federal subsurface minerals are encumbered with Federal oil and gas leases, which grant the lessee a right to explore and develop the leases.

Direct and Indirect Impacts: Not approving the APD could set up a situation in which reservoirs could not be adequately developed and public minerals could be drained by nearby private or state wells, resulting in a loss of revenue due to drainage situations that could be resolved by authorizing APDs. Drainage cases commonly occur in northeastern Colorado where land and mineral ownership patterns are complex.

Cumulative Impacts: None
Mitigation/Residual Effects: None

3.2.3 SOILS (includes a finding on standard 1)

Affected Environment:

The Weld county soil survey has identified the soil series in the proposed project area as:

Olney fine sandy loam, 0 to 1 percent slopes. The Olney component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on plains. The parent material consists of mixed deposit outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R067BY024CO Sandy Plains ecological site. Nonirrigated land capability classification is 4c. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 10 percent.

Vona sandy loam, 1 to 3 percent slopes. The Vona component makes up 85 percent of the map unit. Slopes are 1 to 3 percent. This component is on terraces, plains. The parent material consists of alluvium and/or eolian deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R067BY024CO Sandy Plains ecological site. Nonirrigated land capability classification is 4e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 9 percent.

Environmental Effects

The proposed development could result in a small percent of increased wind erosion during initial operations of associated with construction and drilling. A high risk of windblown erosion will continue until those disturbed lands are hardened, reclaimed by vegetation cover, protected by tackifier, straw, or manure, or protected by other methods. On the fee minerals estate, such protection is likely to be required by the landowner, but that is not assured. Overall-negative effects to soil resources, such as loss of top soil resulting from wind erosion should be reduced significantly through the correct implementation of interim and final reclamation measures

Proposed Action

Direct and Indirect Impacts: This action would result in up 10 acres of total of combined disturbance during the construction phase being. Well pad construction would require approximately 12,982 yrd^3 of top soil stripped (at 12 inch depth). In the event the well is developed into a production well, the amount of long term disturbance would be approximately 1 acres pad size following successful interim reclamation including re-contouring and seeding. The proposed action would have a moderate to major direct impact to soils present at the construction site. Indirectly, the increased runoff from the disturbed soils could result in increased erosion and gullying down gradient. Due to the

gentle slopes and construction standards being proposed impacts to soils off site would be minor.

Cumulative Impacts: The area around the proposed wells has a variety of factors effecting soils including roads, housing, agriculture, and livestock grazing. The addition of the infrastructure needed to drill the pads would have an additional impact to the areas soils. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled. This could add a large amount of disturbance that could have a larger impact on soils in the future.

Mitigation/Residual Effects: After completion and/or abandonment of the wells, the soils would still be irreversibly different than they originally were. Overall, with the proposed reclamation, soil productivity would not be considerably altered if the proposed areas are abandoned. All infrastructure (roads, drill pads, etc.) being proposed, would be built to BLM Gold Book standards. No additional mitigation would be required.

No Action Alternative

Direct and Indirect Impacts: Under this alternative, there would be no new construction. There would be no direct or indirect impact to: soils, risk of increased runoff, or risk of increased erosion in the proposed project area.

Protective/Mitigation Measures: N/A

3.2.4 WATER (SURFACE AND GROUNDWATER, FLOODPLAINS) (includes a finding on standard 5)

Affected Environment: The proposed wells are located in a dry land agricultural field with several irrigated agricultural field adjacent. The area is tributary to the South Platte River and no perennial surface water is nearby. Groundwater in this area consists of the Laramie Fox-Hills aquifer that is used for domestic and agricultural purposes and is generally produced from artesian wells. This aquifer can be up to 350 feet thick, although total thickness of water yielding material rarely exceeds 200 feet. The Lower Fox Hills and upper Pierre Aquifer or upper transition zone of the Pierre shale are also important water resources that should be protected, this interval occurs at depths of about 600' to 1500'. Underlying the Fox Hills is nearly 5,000 feet of Pierre Shale. There are many water wells within a one mile radius of the proposed well. The deepest water well in this area is 160 feet.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Surface water impacts of the proposed wells are mainly associated with the surface disturbance associated with drilling and related infrastructure after well completion. For the McCarthy Federal 1-12 HZ well a total of approximately 10 acres would be utilized for the pad. Since the location is in an existing agricultural field that is plowed yearly, no new impacts would result since most impacts to surface water from oil and gas

activity is due to removal of native vegetation and exposure of mineral soils. Additional surface water impacts could result from chemicals, or other fluids, accidentally spilled or leaked during the development process and could result in the contamination of both ground and surface waters. Best management practices would be contained in the condition of approval that would mitigate this threat.

The drilling of the proposed wells would pass through usable groundwater. Groundwater in this area is relied on for agricultural uses, as well as, domestic use. Potential impacts to groundwater resources could occur if proper cementing and casing programs are not followed. This could include loss of well integrity, surface spills, or loss of fluids in the drilling and completion process. It is possible for chemical additives used in drilling activities to be introduced into the water producing formations without proper casing and cementing of the well bore. Changes in porosity or other properties of the rock being drilled through can also result in the loss of drilling fluids. When this occurs, drilling fluids can be introduced into groundwater without proper cementing and casing. Site specific conditions and drilling practices determine the probability of this occurrence and determine the groundwater resources that could be impacted. In addition to changing the producing formations' physical properties by increasing the flow of water, gas, and/or oil around the well bore; hydraulic fracturing can also introduce chemical additives into the producing formations. Types of chemical additives used in drilling activities may include acids, hydrocarbons, thickening agents, lubricants, and other additives that are operator and location specific. These additives are not always used in these drilling activities and some are likely to be benign such as bentonite clay and sand. Concentrations of these additives also vary considerably since different mixtures can be used for different purposes in oil and gas development and even in the same well bore. If contamination of aquifers from any source occurs, changes in groundwater quality could impact springs and water wells that are sourced from the affected aquifers. Onshore Order #2 requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones.

At this stage, geologic and engineering reviews have been done to ensure that cementing and casing programs are adequate to protect all downhole resources. Known water bearing zones in the APD area are protected by drilling requirements and, with proper practices, contamination of ground water resources is highly unlikely. Casing along with cement would be extended well beyond fresh-water zones to insure that drilling fluids remain within the well bore and do not enter groundwater.

Protective/Mitigation Measures: No additional mitigation is required to protect water resources beyond what is found in other sections of this document and other APD approval requirements.

No Action Alternative

Direct and Indirect Impacts: If the wells are not drilled, no new impacts to either ground or surface water quality would occur.

Protective/Mitigation Measures: None

3.3 BIOLOGICAL RESOURCES

3.3.1 INVASIVE PLANTS*

Affected Environment: Invasive plants are common in the area due to agricultural practices. An established native plant community is not present due to the crop agriculture in the area.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Due to the long-term exposure of the project area to crop agriculture, expected impacts are thought to be minor.

Protective/Mitigation Measures: Equipment used to implement the proposed action should be washed prior to entering the project area to remove any plant materials, soil, or grease. Areas disturbed by project implementation will be monitored for the presence of weeds on the Colorado State Noxious Weed list. Identified noxious weeds will be treated. Monitoring is required for the life of the project and for three years following completion and/or abandonment of the wells and elimination of identified Colorado State Noxious Weeds list A and B species.

No Action Alternative

Direct and Indirect Impacts: None

Protective/Mitigation Measures: None

*Invasive plants are plants that are not part of (if exotic), or are a minor component of (if native), the original plant community or communities that have the potential to become a dominant or co-dominant species on the site if their future establishment and growth are not actively controlled by management interventions, or are classified as exotic or noxious plants under state or federal law. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants.

3.3.3 MIGRATORY BIRDS

Affected Environment: The proposed action is located within the shortgrass prairie ecosystem; however, the physical location of the proposed well is located within a cultivated field. The following species are on the US Fish and Wildlife Services "Birds of Conservation Concern-2008 List for BCR-16 (Shortgrass Prairie) and might occur in the project area based on their habitat requirements: ferruginous hawk, prairie falcon, and Cassin's sparrow.

Ferruginous hawks nest in isolated trees or small groves of trees, and on other elevated sites such as rock outcrops, buttes, large shrubs, haystacks, and low cliffs. Nests are situated adjacent to open areas such as grassland or shrubsteppe. These hawks are closely associated with prairie dog colonies, especially in winter.

Prairie falcons breed on cliffs and rock outcrops, and hunt in adjacent open areas such as grasslands and shrubsteppe. Adults arrive on the breeding grounds in February or March and initiate nesting in late April; young fledge in June and July. Their diet during the breeding

season is a mix of passerines and small mammals. Birds wintering in Colorado prey on passerines, especially horned larks.

Cassin's sparrows breed in northeastern Colorado and throughout the eastern plains with highest concentrations in the southeast. These sparrows inhabit shortgrass prairie with scattered shrubs (including sand sagebrush, yucca, and rabbitbrush), that they use for song perches and nest cover. Breeding birds will accept a wide range of shrub densities as long as grass cover exists. Cassin's sparrows arrive in Colorado in early to mid-April, but most do not initiate nesting until late May. Incubation and brooding take place in June, and most young fledge by mid-July. Their diet consists of invertebrates (beetles, grasshoppers, crickets) and seeds.

Environmental Effects

Proposed Action
Direct and Indirect Impacts: The proposed action will occur within an agricultural field and short-grass prairie environment. Surface disturbing activities associated with oil and gas development, such as road building or pad construction may "take" nests if such activity where to occur during the nesting season. Noise generated during construction, drilling, and production phases will likely result in a larger impact footprint then the disturbance footprint alone. Migratory birds may be burned or killed by exhaust vents, heater-treaters, flare stacks, etc., if perched at the opening while in operation.

An increase is activity, i.e. road traffic, will likely result in an increase in vehicular collisions with migratory birds. The location and surrounding area is highly disturbed by agricultural activity and oil and gas development. While the habitat may not be ideal, some plains birds have adapted to and currently use agricultural lands for reproduction and growth. However, it is likely that species richness and diversity have been forfeited to some degree as a result of this conversion. In this case the addition of oil and gas development will not cause an additional negative impact to migratory birds currently present at the site. If oil is found in economically feasible quantities, it is likely additional development will occur.

Protective/Mitigation Measures: To be in compliance with the Migratory Bird Treaty Act (MBTA) and the Memorandum of Understanding between BLM and USFWS required by Executive Order 13186, BLM must avoid actions, where possible, that result in a "take" of migratory birds. Generally this is a seasonal restriction that requires vegetation disturbance be avoided from May 15 thru July 15. This is the breeding and brood rearing season for most Colorado migratory birds. If the operator prefers to conduct vegetation disturbing activities during the restricted period, the operator may contract a qualified wildlife biologist to conduct a migratory nest survey clearing the project footprint of migratory bird nests prior to vegetation disturbance.

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, and in-line units. Any action that may result in a "take" of individual migratory birds or nests that are protected by MBTA will not be allowed.

No Action Alternative

Direct and Indirect Impacts: None.

Protective/Mitigation Measures: None.

3.4 HERITAGE RESOURCES AND HUMAN ENVIRONMENT

3.4.3 PALEONTOLOGICAL RESOURCES

Affected Environment: The proposed wells are geographically located in a cultivated field overlying part of the geologic feature that is the eastern flank of the Denver Basin. The Basin consists of a large asymmetric syncline of Paleozoic, Mesozoic, and Cenozoic sedimentary rock layers, trending north to south along the east side of the Front Range from about Pueblo north to Wyoming. The basin is deepest near Denver and ascends gradually to its eastern outcrop in central Kansas. Quaternary gravel deposits underlie the proposed well location.
Quaternary gravel deposits are Class 3 geologic formations, according to the BLM's Potential Fossil Yield Classification (PFYC) System that was created to assist in determining proper mitigation approaches for surface disturbing activities (WO IM2008-009). Class 3 indicates moderate potential for paleontologic resources. The potential for this proposed project to be sited on or impact a significant fossil locality is low but somewhat higher for more common fossils.

Environmental Effects

Proposed Action: The, proposed well pad would have a maximum cut of 4 feet and construction of the well pad would result in approximately 10 acres of new surface disturbance. Existing access to the proposed well will be used.

Construction activities for the proposed well may potentially penetrate the protective cultivated soil layer and potentially encounter protected vertebrate fossils.

Direct and Indirect Impacts: Potential impacts to fossil localities would be both direct and indirect. Direct impacts to or destruction of fossils would occur from unmitigated activities conducted on formations with high potential for important scientific fossil resources. Indirect impacts would involve damage or loss of fossil resources due to the unauthorized collection of scientifically important fossils by workers or the public due to increased access to fossil localities in the Project Area. Adverse impacts to important fossil resources would be long-term and significant since fossils removed or destroyed would be lost to science. Adverse significant impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the proposed project would have the beneficial impact that ground disturbance activities might result in the discovery of important fossil resources.

Protective/Mitigation Measures: The proposed construction of the well pads and access to the well pads may penetrate the protective soil layer impacting the bedrock unit below. Due to the lower probability of the location having fossil resources present, paleontological survey work will not be required however; In order to prevent potential impacts to paleontologic resources, a condition of approval shall be attached to the APD that directs the holder to notify the BLM RGFO immediately if any vertebrate fossils or their traces are discovered during operations. Operations may continue as long as the fossil specimen would not be damaged or destroyed by the activity. Within 5 working days of notification, the BLM RGFO shall evaluate or have evaluated such discoveries and shall notify the operator what action shall be taken with respect to such discoveries.

In many instances where the surface estate is not owned by the Federal Government, the mineral estate is, and is administered by the BLM. Paleontological resources are considered to be part of the surface estate. If BLM is going to approve an action involving the mineral estate that may affect the paleontological resources, the action should be conditioned with appropriate paleontological mitigation recommendations to protect the interests of the surface owner. The surface owner may elect to waive these recommendations.

3.4.5 WASTES, HAZARDOUS OR SOLID

Affected Environment: It is assumed that conditions associated with the proposed project site, both surface and subsurface, are currently clean and that there is no known contamination. A determination will be made by the operator prior to initiating the project, if there is evidence that demonstrates otherwise (such as solid or hazardous wastes have been previously used, stored, or disposed of at the project site).

Nothing in the analysis or approval of this action by BLM authorizes or in any way permits a release or threat of a release of hazardous materials (as defined under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations) into the environment that will require a response action or result in the incurrence of response costs.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Possible contaminant sources associated with the drilling operations are:

- Storage, use and transfer of petroleum, oil and lubricants
- Produced fluids
- General hazardous substances, chemicals and/or wastes
- Concrete washout water
- Drilling water, mud and cuttings

Protective/Mitigation Measures: The following mitigation will assist in reducing potential spills resulting in groundwater and/or soil contamination:

- All Above Ground Storage Tanks will need to have secondary containment and constructed in accordance with standard industry practices or an associated Spill Prevention Control and Countermeasures plan in accordance with State regulations (if applicable).
- If drums are used, secondary containment constructed in accordance with standard industry practices or governing regulations is required. Storage and labeling of drums should be in accordance with recommendations on associated MSDS sheets, to account for chemical characteristics and compatibility.
- Appropriate level of spill kits need to be onsite and in vehicles.
- All spill reporting needs to follow the reporting requirements outlined in NTL-3A.
- No treatment or disposal of wastes on site is allowed.
- All concrete washout water needs to be contained and properly disposed of at a permitted offsite disposal facility.
- If pits are utilized they need to be lined to mitigate leaching of liquids to the subsurface, as necessary.

No Action Alternative

Direct and Indirect Impacts: None
Protective/Mitigation Measures: None

3.5 CUMULATIVE IMPACTS SUMMARY

Air: The area currently has a high degree of alteration in the form of agricultural fields, roads, houses, and oil and gas production. The addition of the infrastructure needed to construct and drill the additional pad and well would have a cumulative impact to the area's air quality; however, given the existing level of development in the area, the proposed well's impact would be very minor. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled on Federal, State, and private lands. This could result in a larger impact to air quality in the future. However, given that the area is currently designated as a nonattainment area for ozone, the state requires additional, more stringent pollution control measures for oil and gas activities in such areas.

With respect to ozone, the current nonattainment area episodic anthropogenic emissions budget approved by the Colorado Air Quality Control Commission (December 12, 2008) for NOx and VOCs (ozone precursors) is 334.6tpd and 425.4tpd respectively. These emissions represent reductions projected to be realized (in 2010) from the implementation of additional rules which are now a part of the Colorado Air Quality Control Regulations (AQCRs). The reductions were modeled to show progress towards attaining the ozone standard for the worst ozone days. The emissions inventory included a comprehensive speciation of point, mobile (on-road and non-road), oil and gas (point and area), and biogenic sources. The Technical Support Document (TSD) for the inventory provides the basis for the inventory and includes broad cross sections of the economy. As such, and given the projected pace of development for the inventory, it is likely that the project emissions for the Cass Farms and 70 Ranch APDs are adequately covered and evaluated in the APCD episodic analysis. Given the likely coverage, it is not anticipated the project will have a measurable impact on regional ozone formation outside of the modeled parameters.

With respect to GHG emissions, the following predictions were identified by the EPA for the Mountain West and Great Plains region (http://www.epa.gov/Region8/climatechange/pdf/ClimateChange101FINAL.pdf):

- The region will experience warmer temperatures with less snowfall.
- Temperatures are expected to increase more in winter than in summer, more at night than in the day, and more in the mountains than at lower elevations.
- Earlier snowmelt means that peak stream flow will be earlier, weeks before the peak needs of ranchers, farmers, recreationalist, and others. In late summer, rivers, lakes, and reservoirs will be drier.
- More frequent, more severe, and possibly longer-lasting droughts will occur.
- Crop and livestock production patters could shift northward; less soil moisture due to increased evaporation may increase irrigation needs.
- Drier conditions will reduce the range and health of ponderosa and lodge pole pine forests, and increase the susceptibility to fire.
- Grasslands and rangelands could expand into previously forested areas.
- Ecosystems will be stressed and wildlife such as the mountain line, black bear, long-nose sucker, marten, and bald eagle could be further stressed.

If these predictions are realized as mounting evidence suggests is already occurring, there could be impacts to resources within the region. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Warmer temperatures with decreased snowfall could have an impact on a particular plants ability to sustain itself within its current range. An increased length of growing season in higher elevations could lead to a corresponding variation in vegetation and change in species composition. These types of changes would be most significant for special status plants that typically occupy a very specific ecological niche. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened or endangered plants may be accelerated. Invasive plant species would be more likely to out-compete native species.

Increases in winter temperatures in the mountains could have impacts on traditional big game migration patterns. Due to loss of habitat, or due to competition from other species whose ranges may shift northward, the population of some animal species may be reduced. Warmer winters with less snow would impact the Canada lynx by removing a competitive advantage they have over other mountain predators. Earlier snowmelt could also have impacts on cold water fish species that occupy streams throughout the planning area. Climate change could affect seasonal frequency of flooding and alteration of floodplains, which could impact riparian conditions. More frequent and severe droughts would have impacts on many wildlife species throughout the region as well as vegetative composition and availability of livestock forage in some areas. Climate change could increase the growing season within the region, however, so longer growing season in theory would result in more forage production provided there is sufficient precipitation. Drier conditions could have severe impacts on forests and woodlands. This could leave these forests and woodlands more susceptible to insect damage and at higher risk of catastrophic wildfires. Increased fire activity and intensity would increase greenhouse gas emissions.

Geologic and Mineral Resources: The proposed action would drill through the Laramie-Fox Hills aquifer to produce hydrocarbons from underlying formations. The Laramie formation also contains important coal and uranium deposits.

Soils: The area around the proposed wells has a variety factors effecting soils including roads, housing, agriculture, and livestock grazing. The addition of the infrastructure needed to drill the wells would have an additional impact to the areas soils. At the watershed scale, the addition of the two proposed wells and related construction would have an immeasurable impact to the soils of the area in the future given the current agricultural use in the proposed project area.

Migratory Birds: The location and surrounding area is highly disturbed by agricultural activity and oil and gas development. While the habitat may not be ideal, plains birds have adapted to and currently use grazed lands for reproduction and growth. However, it is likely that species richness and diversity have been forfeited to some degree as a result of this conversion. The addition of oil and gas development will not cause an additional negative impact to most species of migratory birds currently present at the site. If oil is found in economically feasible quantities, it is likely additional development will occur.

Paleontologic Resources: Potential impacts to fossil localities would be both direct and indirect. Direct impacts to or destruction of fossils would occur from unmitigated activities conducted on formations with high potential for important scientific fossil resources. Indirect impacts would involve damage or loss of fossil resources due to the unauthorized collection of scientifically important fossils by workers or the public due to increased access to fossil localities in the Project Area. Adverse impacts to important fossil resources would be long-term and significant since fossils removed or destroyed would be lost to science. Adverse significant impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the proposed project would have the beneficial impact that ground disturbance activities might result in the discovery of important fossil resources.

CHAPTER 4 - CONSULTATION AND COORDINATION

4.1 LIST OF PREPARERS AND PARTICIPANTS

Please see Interdisciplinary Team Review list for BLM Participants

4.2 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

Native American Tribes were consulted at the lease stage.

CHAPTER 5 - REFERENCES

Bureau of Land Management. 1986. Northeast Resource Area Management Plan and Record of Decision. Lakewood, Colorado.

Bureau of Land Management. 1991. Colorado Oil and Gas Leasing Environmental Impact Statement. Lakewood, Colorado.

Bureau of Land Management. 2008 H-1790-1 National Environmental Policy Handbook. Washington, D.C.

Finding Of No Significant Impact
(FONSI)

DOI-BLM-CO-200-2012-0082 EA

Based on review of the EA and the supporting documents, I have determined that the project is not a major federal action and will not have a significant effect on the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects from any alternative assessed or evaluated meet the definition of significance in context or intensity, as defined by 43 CFR 1508.27. Therefore, an environmental impact statement is not required. This finding is based on the context and intensity of the project as described below:

RATIONALE:

Context: The BLM has received an Application for Permit to Drill (McCarthy Federal 1-12 HZ APD), proposing the construction of 1 well pad location and access road on private surface/private minerals and split estate, in the central part of Weld County, south of the City of Greeley. The federal mineral estate in the vicinity of the proposed surface location is leased and subject to oil and gas development.

The general area description would be defined as rural farmland and ranchland south of the South Platte River Basin. There are few county roads in the project area and a state highway nearby. Most access is limited to private landowner or oil and gas developed roadways. The roadways vary in development but most are dirt/primitive roads.

Extensive oil and gas development has occurred in the nearby Wattenberg field, mostly on private mineral estate.

Intensity:
I have considered the potential intensity/severity of the impacts anticipated from the McCarthy Federal 1-12 HZ APD**.** Project decision relative to each of the ten areas suggested for consideration by the CEQ. With regard to each:

> **Impacts that may be beneficial and adverse:**
> There would be minor impacts to air quality from the proposed wells. Most of this would occur during the drilling phase. Potential impacts might occur to ground water; however such impacts should not occur if strict drilling requirements are followed. Other minor impacts might occur to wildlife and migratory birds but would be mitigated through the use of timing stipulations. Positive impacts include benefits in royalties and revenue generated to the federal government and fee mineral owners, from productive wells. Other indirect effects could include effects due to overall employment opportunities related to the oil and gas and service support industry in the region as well as the economic benefits to state and county governments related to royalty payments and

severance taxes. Other beneficial impacts from the action would be the potential for productive wells being created that would add, albeit in a small way to national energy independence.

Public health and safety:
The proposed action will have a temporary negative impact to air quality through the generation of fugitive dust during the construction phase. Utilization of the road, surface disturbance, and construction activities such as drilling, hydraulic fracturing, well completion, and equipment installation will all impact air quality through the generation of dust related to travel, transport, and general construction. This phase will also produce short term emissions of criteria, hazardous, and greenhouse gas pollutants from vehicle and construction equipment exhausts. Once construction is complete the daily activities at the site will be reduced to operational and maintenance checks which may be as frequent as a daily visit. Emissions will result from vehicle exhausts from the maintenance and process technician visits. The pad can be expected to produce fugitive emissions of well gas, which contains mostly methane and a minor fraction of volatile organic compounds. Fugitive emissions may also result from pressure relief valves and working and breathing losses from any tanks located at the site, as well as any flanges, seals, valves, other infrastructure connections used at the site. Liquid product load-out operations will also generate fugitive emissions of VOCs and vehicular emissions. If the operator is unable to sell any produced gas from the well, then gas flaring will also produce emissions of criteria, HAP, and GHG emissions.

Potential impacts might occur to ground water; however such impacts should not occur if strict drilling requirements are followed. Other minor impacts might occur to wildlife and migratory birds but would be mitigated through the use of timing stipulations. Beneficial impacts from the action would be the potential for productive wells being created that would add, albeit in a small way to national energy independence.

Unique characteristics of the geographic area:
The EA evaluated the area of the proposed action and determined that no unique geographic characteristics such as: wild and scenic rivers, prime or unique farmlands, Areas of Critical Environmental Concern, designated wilderness areas, wilderness study areas or Lands with Wilderness Characteristics; were present.

Degree to which effects are likely to be highly controversial:
The potential for controversy associated with the effects of the proposed action is low. There is no disagreement or controversy among ID team members or reviewers over the nature of the effects on the resource values on public land by the proposed action.

Degree to which effects are highly uncertain or involve unique or unknown risks:
The drilling of oil and gas wells has occurred historically over the past century and although the potential risks involved can be controversial, they are neither unique nor unknown. There is low potential of unknown or unique risks associated with this project due to numerous other well locations having been successfully drilled in this area of Weld County.

Consideration of whether the action may establish a precedent for future actions with significant impacts:
The proposed APD will be limited to standard construction procedures associated with pad/road construction and drilling in Weld County and have occurred historically on split and private mineral estate. There are no aspects of the current proposal that are precedent setting.

Consideration of whether the action is related to other actions with cumulatively significant impacts:
The action is a continuation of oil and gas activities that have historically occurred in the area.

Scientific, cultural or historical resources, including those listed in or eligible for listing in the National Register of Historic Places:
A single historic site (5WL7293), which is not eligible for the NRHP, was recorded during the cultural resources inventories [see Report CR-RG-13-79 (P)]. Therefore, no historic properties will be affected by the proposed undertaking.

Threatened and endangered species and their critical habitat:
There are no known populations of T&E species in the action area.

Any effects that threaten a violation of Federal, State or local law or requirements imposed for the protection of the environment: The proposed action conforms with the provisions of NEPA (U.S.C. 4321-4346) and FLPMA (43 U.S.C. 1701 et seq.) and is compliant with the Clean Water Act and The Clean Air Act, the National Historic Preservation Act, Migratory Bird Treaty Act (MBTA) and the Endangered Species Act.

NAME OF PREPARER: Tomas Kamienski / Aaron Richter

SUPERVISORY REVIEW: Jay Raiford

NAME OF ENVIRONMENTAL COORDINATOR: /s/ Martin Weimer

DATE: 3/19/13

SIGNATURE OF AUTHORIZED OFFICIAL: /s/ Keith E. Berger
Keith E. Berger, Field Manager

DATE SIGNED: 3/21/13

APPENDICES:

ATTACHMENTS:

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ROYAL GORGE FIELD OFFICE

DECISION RECORD

Project Name

DOI-BLM-CO-200-2012-0082-EA

DECISION: It is my decision to authorize the Proposed Action as described in the attached EA. The proposed action is to construct a well pad and access road in order to drill and develop federal minerals from private surface/private minerals. Access to the McCarthy Federal 1-12 HZ well pad would be gained by traveling on existing state, county and rural roads.

The proposed project is located in the central part of Weld County south of the City of Greeley, Colorado. The federal mineral estate within the project boundary is leased and subject to oil and gas development.

The proposed action was analyzed in the Environmental Assessment (EA) DOI-BLM-CO-200-2012-0082 and a Finding of No Significant Impact was reached and an EIS will not be prepared.

RATIONALE: This APD will develop oil and gas resources on Federal minerals Lease COC28428 / private surface, consistent with existing Federal lease rights provided for in the Mineral Leasing Act of 1920, as amended. Extensive oil and gas development has occurred throughout the project area and in the nearby Wattenberg field, mostly on private mineral estate.

The project area currently has a high degree of alteration in the form of agricultural fields, roads, houses, and oil and gas production. The addition of the infrastructure needed to construct and drill the four proposed wells would have mostly temporary and overall minor impacts on resources present in the project area.

MITIGATION MEASURES\MONITORING:

Kerr-McGee O&G Onshore LP would use industry best practices, including watering, graveling, and reseeding to reduce fugitive dust emissions from vehicular traffic and disturbed surfaces. Interim reclamation and existing agricultural practices will be implemented in order to stabilize the site and prevent fugitive dust from being generated. In addition the BLM requirements will apply:

- Process equipment will be permitted by CDPHE in accordance with applicable requirements and required emissions standards to limit the facility's potential to emit and provide appropriate operating, monitoring, and recordkeeping requirements.
- All Drill Rig engines will be required to meet at minimum EPA Non-Road Tier II Emissions Standards.
- The company will perform 'Green Completions' for the well.

- It's recommended that FRAC Pump engines be required to meet EPA Non-Road Tier III Emissions Standards.

It is expected that the operator will comply with these requirements and make every effort to minimize emissions through good engineering and operating practices to the maximum extent practical.

Geology and Mineral Resources: If the proposed project plans to utilize federal minerals in the construction of roads, pad building or for any other construction needs, then compliance with 43 CFR 3600 is required. The project proponent will need to submit an application for a mineral materials disposal with BLM, prior to any disturbance being initiated. Federal mineral materials regulations also apply to split estate (i.e. a private surface landowner could not dispose of federal mineral materials for this project, surface or subsurface, without prior authorization from the BLM).

BLM Onshore Order #2 (OO#2) requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. A review at the Application for Permit to Drill stage includes a geologic evaluation of the potential subsurface formations that will be penetrated by the wellbore, followed by an engineering analysis of the drilling program to ensure the well construction design is adequate to protect the surface and subsurface environment, including the potential risks identified by the geologist, and all known or anticipated zones with potential risks.

BLM will require that the surface casing be run across the aquifers, and placed at least 50 feet into a formation that should not fracture or breakdown with the maximum weighting of mud that may be needed when drilling to the depth that the intermediate casing is going to be set. Before drilling an intermediate hole, the surface casing will be cemented in place to surface between the casing and the formation.

A BLM representative may be on location during the casing and cementing of groundwater-protective surface casing and other critical casing and cementing intervals constructed to isolate subsurface zones that present high risk for potential adverse impact to human health or safety or at high risk potential for environmental contamination.

A cement bond log will be required on the production casing, to ensure the quality of the cement bond between the casing and the formation. A minimum of 100 feet of cement will be required above any producing interval, or any zone of interest. Remedial cementing procedures will be required when cementing doesn't meet BLM requirements.

Paleontologic Resources: The proposed construction of the well pad and access to the well pad will penetrate the protective soil layer therefore impacting the bedrock unit below. Due to the lower probability of the location having fossil resources present, paleontological survey work will not be required however; In order to prevent potential impacts to paleontologic resources, a condition of approval shall be attached to the APD that directs the holder to notify the BLM

RGFO immediately if any vertebrate fossils or their traces are discovered during operations. Operations may continue as long as the fossil specimen would not be damaged or destroyed by the activity. Within 5 working days of notification, the BLM RGFO shall evaluate or have evaluated such discoveries and shall notify the operator what action shall be taken with respect to such discoveries.

In many instances where the surface estate is not owned by the Federal Government, the mineral estate is, and is administered by the BLM. Paleontological resources are considered to be part of the surface estate. If BLM is going to approve an action involving the mineral estate that may affect the paleontological resources, the action should be conditioned with appropriate paleontological mitigation recommendations to protect the interests of the surface owner. The surface owner may elect to waive these recommendations.

Invasive Plants: Equipment used to implement the proposed action should be washed prior to entering the project area to remove any plant materials, soil, or grease. Areas disturbed by project implementation will be monitored for the presence of weeds on the Colorado State Noxious Weed list. Identified noxious weeds will be treated. Monitoring is required for the life of the project and for three years following completion and/or abandonment of the wells and elimination of identified Colorado State Noxious Weeds list A and B species.

Migratory Birds: To be in compliance with the Migratory Bird Treaty Act (MBTA) and the Memorandum of Understanding between BLM and USFWS required by Executive Order 13186, BLM must avoid actions, where possible, that result in a "take" of migratory birds. Generally this is a seasonal restriction that requires vegetation disturbance be avoided from May 15 thru July 15. This is the breeding and brood rearing season for most Colorado migratory birds. If the operator prefers to conduct vegetation disturbing activities during the restricted period, the operator may contract a qualified wildlife biologist to conduct a migratory nest survey clearing the project footprint of migratory bird nests prior to vegetation disturbance.

As described in the proposed action, all open pits will be fenced and netted in a manner to exclude migratory birds until all liquid is absent and backfilling has been initiated. Any secondary containment system will be covered in a manner to prevent access by migratory birds. The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, and in-line units. Any action that may result in a "take" of individual migratory birds or nests that are protected by MBTA will not be allowed.

Wastes, Hazardous or Solid: The following mitigation will assist in reducing potential spills resulting in groundwater and/or soil contamination:

- All Above Ground Storage Tanks will need to have secondary containment and constructed in accordance with standard industry practices or an associated Spill Prevention Control and Countermeasures plan in accordance with State regulations (if applicable).

- If drums are used, secondary containment constructed in accordance with standard industry practices or governing regulations is required. Storage and labeling of drums should be in accordance with recommendations on associated MSDS sheets, to account for chemical characteristics and compatibility.
- Appropriate level of spill kits need to be onsite and in vehicles.
- All spill reporting needs to follow the reporting requirements outlined in NTL-3A.
- No treatment or disposal of wastes on site is allowed.
- All concrete washout water needs to be contained and properly disposed of at a permitted offsite disposal facility.
- If pits are utilized they need to be lined to mitigate leaching of liquids to the subsurface, as necessary.

PROTEST/APPEALS: This decision shall take effect immediately upon the date it is signed by the Authorized Officer, and shall remain in effect while any appeal is pending unless the Interior Board of Land Appeals issues a stay (43 CFR 2801.10(b)). Any appeal of this decision must follow the procedures set forth in 43 CFR Part 4. Within 30 days of the decision, a notice of appeal must be filed in the office of the Authorized Officer at the Royal Gorge Field Office, 3028 E. Main, Cañon City, Colorado, 81212. If a statement of reasons for the appeal is not included with the notice, it must be filed with the Interior Board of Land Appeals, Office of Hearings and Appeals, U.S. Department of the Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203 within 30 days after the notice of appeal is filed with the Authorized Officer.

SIGNATURE OF AUTHORIZED OFFICIAL: /s/ Keith E. Berger
Keith E. Berger, Field Manager

DATE SIGNED: 3/21/13

ATTACHMENTS: